

Question 20 (4 marks)

- (a) Identify ONE common household base.

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- (b) A student used indicators to determine whether three colourless solutions were acidic or basic. The indicators used are shown in the table.

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Indicator	Colour change	pH range
Methyl orange	red to yellow	3.2–4.4
Methyl red	red to yellow	4.8–6.0
Thymol blue	yellow to blue	8.0–9.6
Alizarin	red to purple	11.0–12.4

Samples of each solution were tested with the indicators. The colours of the resulting solutions are shown in the table.

Indicator added	Colour of solution A	Colour of solution B	Colour of solution C
Methyl orange	yellow	yellow	yellow
Methyl red	yellow	yellow	yellow
Thymol blue	blue	blue	yellow
Alizarin	purple	red	red

The student concluded that each of the three solutions tested was basic. Assess the validity of this conclusion.

The validity of this conclusion is not very strong as when the three solutions were tested with different indicators contrasting results formed. Solution C looks very acidic. Solution A ~~se~~ changed the indicator colour every time. Solution B seemed to be in the range of 3.2–9.6, again not showing whether it was acidic or basic but rather both. Therefore validity of this conclusion is extremely weak and needs to be re-assessed.